United States Department of Agriculture

Annual Ryegrass Interseeded into Silage Corn, Broadwater County

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County: Broadwater
Average annual precip: 12-13”
MLRA: 44, Northern Rocky Mountain Valleys
Dominant Soil Type: BsA, Brocko silk loam, 0-2% slopes
Acres: small plots of 100 x 25 ft each within a 140 acre field
Planting Date: Silage corn: June 5 Annual ryegrass: July 13
Seeding Rate: Silage corn: 25k seeds/ac
Annual ryegrass: 30 lb/ac
Seeding Method: broadcast with hand seeder
Row Spacing: 22 inches
Tillage: conventional
Herbicides: Post: Glyphosate and 2,4-D applied on July 12
Irrigation: center pivot
Termination Date: Silage harvested on Oct 8, annual ryegrass winter- killed

Fig. 1. Annual ryegrass growing after corn silage harvest. Oct 16, 2018.

Table 1. Monthly precipitation at Townsend, MT. Western Regional Climate Center, station #248324.

Townsend	J	F	M	A	M	J	J	A	S	O	N	D	Total
30 yr avg 1981-2010	0.26	0.25	0.49	0.78	1.82	2.24	1.35	1.13	0.89	0.54	0.33	0.30	10.38
2016	0.25	0.05	0.53	1.25	3.26	1.39	1.4	1.6	1.17	1.59	0.02	0.54	13.05
2017	0.24	0.39	0.25	1.88	1.83	1.8	0.58	0.3	1.18	0.27	0.88	0.68	10.28
2018	0.37	0.36	0.98	1.05	2.92	4.18	0.14	1.02	0.92	0.83	0.19	0.20	13.16

Introduction:

Annual ryegrass cover crop seeded into standing corn is becoming a common practice in the mid-West corn belt to protect against wind and water erosion over the winter. A field trial was conducted in 2018 near Toston, MT to see if this same technique would work in the shorter growing season of Montana. Timing is essential when interseeding. Corn is planted first and allowed to establish. Annual ryegrass (*Lolium multiflorum*) is seeded when corn is at the V5 stage. Seeding ryegrass earlier will stunt the corn yield. Seeding it later will not allow the ryegrass to establish. Annual ryegrass is the preferred interseeded crop as it can tolerate the shade of the corn crop. Radish and red clover are also shade tolerant and could be used in a mix of the three species. Once the corn is harvested, the ryegrass has access to sunlight and can continue to grow until active growing degree days end in October. For this reason, silage corn is the preferred crop to interseed into in Montana, rather than grain corn. Silage corn is harvested early enough in the fall to allow for additional growth and establishment of the ryegrass. Grain corn is often harvested too late to allow for additional fall growth of the ryegrass.

Results:

Silage corn was planted on June 5 on 22-inch row spacing at a population of 25k plants/acre. Annual ryegrass was broadcast into the corn on July 13 at a rate of 30 lb/acre when the corn was at the V5 stage, and again in separate plots in September when the corn was fully grown. Six varieties of annual ryegrass were used at both seeding dates, with one variety per plot. There were 12 plots in total and no plot replication. Seeding rate of annual ryegrass was greater than the normal rate of 18-25 lb/acre to ensure establishment. Silage was harvested on October 8, and plots

were sampled for biomass on Oct 16. There were 1713 Growing Degree Days (Base 40) from the time of seeding to sampling the annual ryegrass. Gulf, KB Royal, and KB Supreme varieties yielded the most biomass, although there was no plot replication to make any statistical determination. Biomass was air-dried in the office prior to weighing.

Table 2. Aboveground biomass of six annual ryegrass varieties.

Variety	Pounds/ac
KB Royal	1,280
KB Supreme	1,160
Ed	900
Gulf	1,780
Tetrastar	760
Meroa	900

Annual ryegrass seeded at the V5 stage of corn growth produced an even cover for the soil, however ryegrass seeded in September 2018 did not establish well and this timing window is not recommended. Silage harvest on Oct 8 did significant damage to the annual ryegrass with the corn chopper tracks in the wet field. When possible, the silage should be chopped when soils are dry to minimize damage. Annual ryegrass did not overwinter well at this location. While residue remained as a soil protectant, the growing green plants were very thin the following spring.

Fig. 2. Broadcast seeding annual ryegrass into silage corn at the V5 stage, July 13, 2018 (l). Ryegrass completely covering the soil after silage harvest, Oct 16, 2018 (c). Ryegrass plots with substantial winter kill and die-back, April 30, 2019 (r).

Summary and Discussion:

Overall, we were very pleased with the results and discovered this is a viable technique for Montana. Interseeding methods may include aerial application, broadcast, or drilling. More information can be found at Interseedingcovers.com. Weeds must be controlled prior to seeding the cover crop and care must be taken to not use the corn chopper when the field is too wet. Because silage corn leaves such little residue, it is recommended that the ryegrass cover crop not be grazed or hayed, but left on the field to protect against wind and water erosion over the winter. Care must also be taken that the annual ryegrass does not become a weed in the crop rotation. Do not plant a small grain following annual ryegrass and consult with an agronomist for proper herbicide control. Because of the potential for annual ryegrass to become a weed in cereal grain crops, Area office approval must be given to NRCS staff prior to planning any cover crop with this species.

https://www.nrcs.usda.gov/wps/portal/nrcs/mt/soils/health/